# Report and Recommendations of the Urban Pest Management Working Group

**Submitted to the Pest Management Advisory Committee**

**by the Urban Pest Management Working Group**

## Department of Pesticide Regulation

## February 14, 2008

# Executive Summary

At its quarterly meeting in Fall 2006, DPR's Pest Management Advisory Committee (PMAC) proposed establishing a working group to better address urban pest management. This was a result of a report issued from an earlier working group of the PMAC, Pest Management in the 21st Century (PM21), which identified urban pest management as an increasingly significant issue warranting additional allocation of DPR resources and oversight.

The Urban Pest Management Working Group (UPMWG or Working Group) met monthly from January 2007 through January 2008 to focus on challenges and opportunities tied to pest management in the State's rapidly expanding urban areas. Members included leaders in urban pest management, water quality experts, and representatives from government, academia, industry and environmental groups, with a wide array of perspectives and priorities.

### Goal of the Working Group

The Group's goal was to generate creative recommendations for the PMAC's consideration to assist DPR address pest management challenges in urban areas. DPR could then leverage its resources by working with local, regional, state and federal agencies, business entities, academia, and nongovernmental organizations.

### Pesticide-use Issues: Challenges and Opportunities

At the Group's initial meetings, members were invited to present urban pest management challenges and opportunities, provide definitions, offer recommendations, and justify the recommendations.

Eleven priority areas were identified:

| Pesticide Use Challenges & Opportunities | |
|---|---|
| 1 Preconstruction Pesticide Applications | 6 Interior Applications (e.g., to baseboards) |
| 2 Perimeter Applications Around Structures | 7 Incorporation Into Products |
| 3 Pesticide–Fertilizer Combination Products | 8 Professional Landscapers |
| 4 Sewer Line Applications | 9 Unlicensed & Untrained Applicators |
| 5 Treatment of People & Pets for Arthropod Pests | 10 Indoor Total-release Foggers |
| | 11 Improving Education & Outreach |

Most of these issues are driven by concerns about water quality tied to urban pesticide users. The issues highlight potential impacts to stormwater districts and sewage treatment plants. Some of the issues reflect concerns about pesticide risk to human health. Opportunities such as consumer education and outreach were also identified as priority areas.

The types of pesticides considered were primarily insecticides and herbicides; the Group agreed that antimicrobials would not enter into the discussion. The Group discussed the need to balance the protection offered by pesticides with risk from their use. The Group also agreed that proposed recommendations would not be limited by DPR's staff or funding constraints. DPR would address such limitations when assessing priorities.

Once recommendations were proposed, the Group agreed on wording, and then voted in support of the recommendation. Unanimously supported recommendations are listed on pages iii– iv. Recommendations that received less than full support are listed in the Pesticide Issue worksheets (pages 7–18) and in the detailed worksheets in Appendix 3. The Group decided that recommendations receiving less than full support would not be ranked by the number of supporting votes.

### Pesticide Users

The issues considered various pesticide-using audiences. These include nonprofessional consumers such as homeowners, teachers, and custodians; retail store employees; certified or licensed professionals; and those in ancillary industries (e.g., building construction) that sometimes overlap with pesticide use.

Nonprofessional pesticide consumers were cited most frequently as the target audience for recommendations. Working Group members mentioned that nonprofessional consumers often lack training and do not follow label directions. Members agreed that nonprofessional consumers were more likely to overapply or misapply pesticides than were professionals, and that pesticide mishaps can result because consumers lack education and awareness about pesticide safety and IPM.

### Additional Opportunities

Two issues consistently overlapped with the others—improving education and outreach, and improving pesticide use reporting. Although the former was approved by the Working Group as a separate issue, the Group could not reach consensus on the latter. For many of the issues, education and outreach was a common thread, whether developing best management practices for the construction industry, teaching people how to apply garden pesticides correctly, or educating nonprofessional consumers about the many alternative practices available.

As for pesticide use reporting for urban products, several Working Group members expressed concern that DPR's current use-reporting system does not gather sufficient data. Other Working Group members expressed a need to balance practical and business-related concerns with the Department's and public's need for better information gathering.

---

**The submittal of the attached report represents the completion of the Working Group's charge from the PMAC.**

# Recommendations Fully Supported by the Urban Pest Management Working Group

| | |
|---|---|
| **Issue 1: Preconstruction Pesticide Applications** | |
| **1** | DPR discuss with representatives from the building and pesticide applicator industries opportunities to develop and implement best management practices (BMPs) to minimize the risk of pesticide runoff associated with preconstruction applications from entering water bodies or stormwater systems. |
| **2** | DPR consult with U.S. EPA about the feasibility of including those BMPs as modifications to preconstruction pesticide product labels. |
| **Issue 2: Perimeter Applications Around Structures** | |
| **1** | DPR support an IPM certification program with the Structural Pest Control Board (SPCB) for structural pest management.<br>♦ Site-based certification by an accredited third party.<br>♦ Professional certification (business and individual) to design and service a site-based IPM plan<br>♦ Certification of nonprofessionals such as municipal and business employees (e.g., janitors). |
| **2** | Educate consumers to ask about safe and effective alternatives to perimeter treatments if they are hiring professionals. |
| **3** | DPR discuss with representatives from the SPCB and the pesticide applicator industry opportunities to<br>♦ Develop and implement best management practices (BMPs) that reduce pesticide runoff associated with perimeter applications<br>♦ Establish education and training to teach and implement the BMPs. |
| **Issue 3: Pesticide–Fertilizer Combination Products** | |
| **1** | Provide better education to the public and professionals about when various garden chemical products are required and when application is best timed. |
| **2** | Promote use of applicators that reduce deposition of granules on hard surfaces (e.g., Scotts Miracle-Gro's Edgeguard). |
| **3** | Educate people to sweep granules off of hard surfaces and on to lawns, and not to hose off or sweep granules into the gutter or storm drains. |
| **Issue 4: Sewer Line Applications** | |
| **1** | DPR work with TriTAC to design and implement a notification system so that sewage treatment plants will know in advance the date, amount, and active ingredients of collection system sewer treatments for root control. |
| **Issue 5: Treatment of People and Pets for Arthropod Pests** | |
| **1** | Explore with the California Integrated Waste Management Board, and others as appropriate, the potential for marketing single-use packages |
| **2** | DPR consider using methods developed by the Pyrethroid Working Group to evaluate pesticides for removal efficiency. |
| **Issue 6: Interior Applications (e.g., to baseboards)** | |
| **1** | Promote preventive practices in a context of IPM through a consumer education campaign. |

| | |
|---|---|
| Issue 7: Incorporation Into Products | |
| 1 | DPR should consider regulating products that intentionally incorporate pesticides, *even if pesticidal claims are not made*. Only grant registration if pesticidal claims are determined to be valid. |
| 2 | Consider availability of alternatives when registering products whose active ingredients pose environmental or health problems. |
| Issue 8: Landscape Application by Professionals | |
| 1 | DPR support efforts to promote landscape designs that reduce runoff of pesticides. |
| 2 | DPR support efforts to establish a voluntary IPM Certification program for landscape professionals. |
| 3 | DPR explore ways (including enforcement) to increase licensing among unlicensed individuals such as maintenance gardeners who apply pesticides for hire. |
| 4 | DPR promote education of consumers about the need to hire only licensed professionals to apply pesticides in their homes and landscapes. |
| 5 | DPR explore requiring additional continuing education units that would include IPM. |
| Issue 9: Unlicensed and Untrained Applicators | |
| 1 | DPR work with the retail industry and others as appropriate to ensure that store employees who advise customers are adequately trained. |
| 2 | DPR work with county agricultural commissioners and local enforcement to prevent pesticide applications for hire by unlicensed professionals until they can obtain training and certification in pesticide safety and IPM practices. |
| 3 | DPR work with the University of California and UC IPM to establish a regional urban IPM training center to train applicators—both licensed and unlicensed—in IPM practices. |
| 4 | DPR work to enable unlicensed Maintenance Gardeners who use pesticides to obtain Qualified Applicator certificates (QACs). |
| 5 | Provide point-of-purchase information about pesticide safety, disposal and less-toxic alternatives at places where consumers or maintenance gardeners purchase pesticides. |
| Issue 10: Indoor Total-release Foggers | |
| 1 | DPR acquire data about explosions and fires caused by foggers. |
| 2 | DPR develop better information to inform consumers about appropriate use and risks of foggers. |
| 3 | DPR improve consumer education including point-of-sale messages about IPM alternatives and long-term solutions. |
| Issue 11: Improving Education and Outreach | |
| 1 | DPR, in collaboration with academia, business and nongovernmental organizations, develop and implement a strategy to educate and inform nonprofessional pesticide applicators (e.g., consumers and building custodians) on alternative pest management practices, the selection of reduced-risk pesticide products, and appropriate pesticide application practices to minimize impacts to human health and the environment. |

# Table of Contents

# Introduction

The Urban Pest Management Working Group (UPMWG) is a working group of the Department of Pesticide Regulation's (DPR) Pest Management Advisory Committee (PMAC). At its quarterly meeting in Fall 2006, PMAC members proposed establishing the UPMWG to better address urban pest management. That recommendation was a result of a report issued from an earlier working group of the PMAC, Pest Management in the 21st Century (PM21), which identified nonagricultural pest management as an increasingly significant issue warranting additional allocation of DPR resources and oversight.

# Background

The PMAC was established by the Legislature (SB 1752) in 1994, and codified under section 12536 of the California Food and Agriculture Code. The purpose of the PMAC is to provide advice and guidance to DPR on how to best fulfill the Department's mission. The functions of the PMAC include advising DPR on regulatory development and reform initiatives, identifying and evaluating proposed modifications to current DPR policies and procedures, assisting DPR to identify, facilitate, and promote reduced-risk pest management practices and pest management systems, promote the Integrated Pest Management Innovator Program, and review applications for grant monies.

At the PMAC Winter 2005 quarterly meeting (February 23, 2005) DPR's Director, Mary-Ann Warmerdam, proposed that the PMAC establish a working group to develop strategic recommendations that would help the Department best use its resources and talents over the next decade to achieve its mission, goals and objectives in California's rapidly changing demographic landscape. In March 2005, the PM21 Working Group held its initial meeting. Member selection was based on expertise, knowledge, background diversity, and the willingness to consider solutions beyond traditional perspectives held by the constituencies they represent. In her opening remarks the Director encouraged the PM21 Working Group to look beyond the agricultural setting, which has been DPR's primary area of focus since its inception, and "take into account an increasingly urban, culturally diverse and consumer-oriented state" as part of its assessment and development of recommendations.

In its report to the PMAC, the PM21 Working Group recognized that "[o]ne of the greatest challenges facing DPR is the rapidly expanding urban population and associated increases in urban pest management activities, including urban pesticide use." Id. at page 6. One of the Working Group's recommendations to the PMAC was that DPR should "reassess the allocation of [its] resources to determine how to adequately address pest management practices in the urban setting." The PM21 Working Group submitted its final report and recommendations to the PMAC at the Fall 2005 quarterly meeting (November 10, 2005).

At its Spring 2006 quarterly meeting (March 24, 2006), the PMAC formally adopted a set of recommendations based on the recommendations of the PM21 Working Group. One of the recommendations adopted by the PMAC encouraged the Director to "[e]xpand the department's efforts to address urban pest management." *Motion Adopted Unanimously by the PMAC on March 24, 2006*. The Director accepted the PMAC recommendations.

To assist DPR in addressing the this recommendation, the PMAC proposed forming a working group initially comprised of PMAC members plus a representative from the water boards. (See **Appendix 1** for a list of the Working Group members.) The Director approved the proposal, and the Urban Pest Management Working Group (UPMWG) was convened on January 29, 2007. The UPMWG met on a monthly basis throughout 2007.

## Director's Charge to the UPMWG

At its initial meeting (January 29, 2007), the Director provided an overview and direction to the Working Group. The Director recognized that that historically DPR has focused its resources (staff and dollars) primarily on agricultural pest management and synthetic pesticide use. Given California's projected population growth (7–9 million people in the next 10–20 years), DPR needs to reassess its priorities and will likely need to focus more of its resources on nonagricultural (urban) pest management issues and pesticide use.

The Director charged the UPMWG to:

- Develop a set of recommendations for the PMAC's consideration designed to assist DPR address pest management challenges in nonagricultural (primarily urban) settings;
- Identify opportunities for DPR to leverage its resources through coordination with and integration of ongoing urban pest management partnerships;
- Recommend innovative partnerships with local, regional, state and federal agencies, business entities, academia, and nongovernmental organizations; and
- Identify opportunities to integrate applicable recommendations by the PMAC's Pest Management in the 21st Century Working Group into this effort.

## Key Factors and Challenges Identified by the UPMWG

During its initial brainstorming session the UPMWG recognized several factors and challenges that need to be addressed, as well as potential opportunities, to ensure the success of any strategic approach to address urban pest management issues and pesticide use.

- California's rapidly increasing population will likely result in increased pesticide use, and potentially increase the environmental impacts associated with increased use.
- California's increasing population will increase the demands on many government sectors for sanitary conditions and pest management.
- Replacing one pesticide with another may not necessarily result in the desired reduction of impacts to the environment and human health.
- The replacement pesticide may also be hazardous to human health or the environment.
- Need to recognize that there are public health concerns and responsibilities that obligate facilities, businesses, or government agencies to undertake specific pest management actions.
- Modifying people's behavior and perspective toward pest management is critical to the success of any urban pest management strategy. This will require increasing people's

awareness of potential impacts associated with their pest management decisions, informing them of IPM practices, and educating people about proper pesticide use.

- Any successful DPR urban pest management strategy will necessarily involve expanding its working relations with existing partners (e.g., water boards, universities), and undoubtedly lead to new public and private partnerships (e.g., stormwater permittees, managers of publicly owned treatment works, public interest groups).
- Recognizing other government obligations that can affect urban pest management practices (e.g., water boards' responsibilities under state and federal Clean Water Acts; NPDES permits for stormwater agencies and POTWs).
- Promoting voluntary, preventive practices and programs in the business community (e.g., building industry use of preconstruction termiticides), and among pest management professionals.
- Opportunities need to be explored to increase the role and promote new business opportunities for pest management professionals to advance IPM practices, reduced-risk pesticide selection, and application practices.

---

# The Process

### Ground rules

The Working Group agreed that they would probably not reach consensus on everything, but would seek common understanding. Members also agreed to share information; debate issues, not people (or causes); respect everyone's right to speak; avoid side conversations; and respect differing positions.

### Working Group Members

The PMAC decided that the working group composition for the initial meeting would consist of PMAC members plus a representative from either the State Water Quality Control Board or one of the predominantly urban regional water boards. We also suggested the possibility of bringing in others who could make a valuable contribution to the working group's mission. As with all working groups, the intent was to keep the number to a manageable size to maximize efficiency, but also ensure that we represented all perspectives. All meetings were open to the public. For lists of Working Group members and the groups or interests they represent, see **Appendix 1**. Interested parties are listed in **Appendix 2**.

### Pesticide use issue template and worksheets

Mark Rentz developed the original template as a matrix, which was revised by the Working Group to its present form. The term "template" is used for the model, and "worksheet" for the developed product. Each issue had its own worksheet (e.g., worksheet for Preconstruction Pesticide Applications).

From February to April 2007, the Working Group proposed different worksheet configurations. In April, the final version was approved by the group:

| **Issue** | **{Use type or overarching issue}**<br>**{Issue Proponent's Name(s)}**<br>Identify the pesticide application or use (e.g., Preconstruction Pesticide Applications) , or overarching issue (e.g., Unlicensed and Untrained Applicators) that the worksheet covers. Also identify the issue proponent. |
|---|---|
| **Concerns**<br>[one or more] | Briefly describe what's driving the issue in terms of impacts to the environment or human health. Be as specific as possible. Also, if appropriate, describe potential impacts on other regulatory programs. |
| **Justifications for Concerns** | Briefly describe any research, data, analysis, or other information that substantiates the concerns. The justifications will likely provide the basis for subsequent recommendations. |
| **Responses to Concerns and Justifications** | This section allows other Working Group members to provide feedback or additional information that may be valuable to the Working Group's decision making. Responses could include additional statutory or regulatory mandates that need to be considered, or additional information that supports or refutes the concerns or justifications. |
| **Recommendations** | Are there documented solutions that can serve as case studies? Local solutions? |
| **Rationale for Recommendations** | Briefly identify how the recommendations will address the concerns. If possible, identify the effectiveness as compared to other possible actions. |
| **Potential Impacts of Recommendations** | Discuss the trade-offs (pluses and minuses) of the recommendations, including effectiveness in terms of achieving pest management goals, economic impacts, feasibility of alternate courses of action.<br>***Note***: Although the Working Group agreed that this portion has merit, we omitted it because we assumed we would suggest impacts that were speculative and repetitive. |
| **Extent of Agreement Among Working Group** | To be completed by the group before signing off on the issue and associated recommendations. |

The Working Group agreed that although each issue had its own proponent, the entire Group would make the final call on the product forwarded to the PMAC. The Group also agreed that if any disagreements among members could not be resolved, the final report would reflect that. For each issue, opposing perspectives are described in "Responses to Concerns and Justifications," **Appendix 3.**

### How were issues chosen?

The Working Group brainstormed ideas for the issues during meetings from February through May 2007. Members volunteered as proponents of the issues, agreeing to compile information for the worksheets. We agreed on a meeting schedule and when specific issues would be discussed.

### Selection of issues

The Working Group decided to consider the following issues:

**Pesticide Use Challenges & Opportunities**

1. Preconstruction Pesticide Applications
2. Perimeter Applications Around Structures
3. Pesticide–Fertilizer Combination Products
4. Sewer Line Applications
5. Treatment of People & Pets for Arthropod Pests
6. Interior Applications (e.g., to baseboards)
7. Incorporation Into Products
8. Professional Landscapers
9. Unlicensed & Untrained Applicators
10. Indoor Total-release Foggers
11. Improving Education & Outreach

### Pesticide Use Reporting for Urban Pesticides

Throughout the course of its deliberations, several members of the Working Group expressed concern that DPR's current pesticide use reporting and sales data systems do not provide adequate opportunity to gather, compile and analyze data associated with urban pesticide use. Other Working Group members also expressed a need to carefully balance practical and business-related concerns with the Department and public's need for better information. The Working Group was informed that DPR is currently reviewing its existing information technology and data systems to make improvements.

Several Working Group members also felt that incomplete information on the amount of pesticides applied by residential users and unlicensed individuals limited the Group's ability to fully evaluate each issue.

While the Working Group did not have sufficient opportunity to explore use reporting fully, members agreed that improved data could provide meaningful perspective to DPR decisions. The PMAC may want to consider whether to recommend that DPR consider tools that would provide a clearer characterization of urban pesticide use and sales.

## What's Driving the Issues?

The urban population of California is growing yearly, resulting in more housing, commercial and recreational areas, and infrastructure, all of which will increase the demand for pesticide use.

### Water quality impacts—toxicity to water bodies

Scientific studies by stormwater programs, wastewater treatment plants, the University of California, the California Regional Water Quality Control Boards, U.S. Geological Survey,

and U.S. EPA have found pesticides in local creeks, urban runoff, and wastewater treatment plant effluent.

Both U.S. EPA and the State Water Resources Control Board (State Water Board) have determined that many water bodies in urban areas of California are impaired from pesticides (i.e., contaminated despite their use for drinking, swimming, or fishing) according to the Clean Water Act §303(d). This means that cities and counties, through their NPDES[1] permits, have to restore the beneficial uses of the water bodies, which involves expensive prevention and mitigation programs.

### The source of toxicity

During the early 2000s, U.S. EPA began phasing out residential uses of the organo-phosphates, diazinon and chlorpyrifos. Pyrethroids began to replace them for a variety of urban uses, including outdoor applications to control insects—especially ants—around buildings, on lawns, and in gardens; indoor sprays and foggers to control nuisance insects; and underground injection to control termites.

Runoff from irrigation and rainfall washes a small portion of the pyrethroids applied to outdoor surfaces into urban creeks. In urban creeks draining to the San Francisco Bay–Delta Estuary, pyrethroid insecticides were found at levels toxic to sediment-dwelling organisms (*Hyalella azteca*) that make up part of the aquatic food web. However, it only takes a small portion—parts per trillion—to kill *H. azteca*.

Pyrethroids are not the only insecticides sprayed around buildings. Fipronil is a newer insecticide steadily gaining popularity as a broadcast perimeter spray for ants[2]. Studies show that fipronil and its degradates are highly toxic to aquatic species. Liquid or granular formulations of pyrethroids and fipronil can contaminate water. When applied to impervious (nonabsorbent) surfaces, rain or irrigation can wash the pesticide into storm drains, and the contaminated water is then transported into urban creeks.

### Risk to humans

Pesticides serve an essential role as a management tool for pests that threaten our health, attack or annoy us or our pets, and destroy our property. In urban areas, potential vectors of microorganisms such as cockroaches and rats have evolved closely with humans, and usually reproduce quickly and prolifically, disperse rapidly, and find food easily.

Working Group members acknowledged a balance between the protective role of pesticides and their risks, especially to sensitive populations such as children, the elderly, the immune compromised, and pregnant women. Members also expressed concern about risk when label directions are not followed.

---

[1] National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources such as pipes or ditches that discharge pollutants into waters of the United States.

[2] Moran, K.D. 2007. Urban Use of the Insecticide Fipronil—Water Quality Implications. Memo by TDC Environmental for the State Water Resources Control Board. 14 pp.

# ISSUE 1: Preconstruction Pesticide Application

### Concerns

During building construction, termiticides are often applied to the soil surface of the foundation excavation before concrete is poured. If rainfall occurs after the termiticide application and before the concrete is poured, runoff from exposed treated areas could mobilize contaminated sediment into urban creeks.

### Recommendations Fully Supported by Working Group

1 DPR discuss with representatives from the building and pesticide applicator industries opportunities to develop and implement best management practices (BMPs) to minimize the risk of pesticide runoff associated with preconstruction applications from entering water bodies or stormwater systems.

2 DPR consult with the U.S. EPA about the feasibility of including those BMPs as modifications to preconstruction pesticide product labels.

### Recommendations Not Fully Supported by Working Group

3 DPR consult with the State Water Resources Control Board regarding modification of their General Permit for Construction Sites to require construction site managers to: (1) identify pesticide applications such as termiticides and herbicides that will take place before or during construction; and (2) include BMPs to minimize runoff associated with preconstruction pesticide applications in their Storm Water Management Plan for the construction site.

4 DPR evaluate opportunities to design and implement cost-effective metrics to measure the implementation and effectiveness of the BMPs.

[For 3 & 4, all except Consumer Specialty Products Association and Western Plant Health Association]

### Rationale for Recommendations

Once BMPs are developed, listing them on product labels would ensure that applicators understand their responsibility when applying pesticides at construction sites. Product label information and outreach to the construction industry would help increase BMP awareness and implementation.

# ISSUE 2. Perimeter Applications Around Structures

### Concerns

Pesticides run off into foundation drains or directly into storm drains from rain or irrigation. When applications are made to impervious surfaces such as concrete or asphalt, the chance of runoff increases. Broadcast applications around the entire perimeter of a building may result in an unnecessarily high amount of applied active ingredient, especially when these applications are made on a calendar-based schedule.

### Recommendations Fully Supported by Working Group

**1** DPR support an IPM certification program with the Structural Pest Control Board (SPCB) for structural pest management.

- **a** Site-based certification by an accredited third party.
- **b** Professional certification (business and individual) to design and service a site-based IPM plan.
- **c** Certification of nonprofessionals such as municipal and business employees (e.g., janitors).

**2** Educate consumers to ask about safe and effective alternatives to perimeter treatments if they are hiring professionals.

**3** DPR discuss with representatives from the SPCB and the pesticide applicator industry opportunities to:

- **a** Develop and implement best management practices (BMPs) that reduce pesticide runoff associated with perimeter applications
- **b** Establish education and training to teach and implement the BMPs.

### Recommendation Not Fully Supported by Working Group

**4** Increase monitoring, surveillance, and enforcement to identify, prevent, and correct applications that result in pesticide releases to surface water.

[Support by all except California Agricultural Commissioners and Sealers Association, Consumer Specialty Products Association & Western Plant Health Association]

### Rationale for Recommendations

One of the main reasons for perimeter applications of pesticides is to keep Argentine ants out of buildings. Colonies of these ants are massive, and perimeter applications of pesticides have only limited, short-term effects. Pest control operators (PCOs) successfully use a variety of IPM practices that include exclusion, sanitation, and strategic placement of baits.

Certification efforts are underway for municipally employed PCOs. The San Francisco Bay Water Board requires municipalities to implement IPM policies. A number of PCOs are being trained by EcoWise Certified, a Proposition 13-funded project of the Association of Bay Area Governments. The Pest Control Operators of California is interested in changing the focus from pest control company certification to site certification (e.g., buildings), much the way organic farms or green buildings are certified.

Many consumers who hire PCOs are either unaware of IPM practices or, if they prefer an IPM approach, don't know how to ask for this kind of service or where to find it.

Best management practices that reduce pesticide runoff would help stem contamination of water. Buildings are often surrounded by impervious surfaces such as concrete. Broadcast perimeter applications to these surfaces easily wash off from rain or irrigation. In fact, U.S. EPA's recent reregistration of cypermethrin limits outdoor applications made on impervious surfaces to spot treatments only.

DPR and County Agricultural Commissioners are currently underfunded to conduct monitoring, surveillance, and enforcement in urban areas. DPR created an initial, statewide program to do this, but it was never funded.

# ISSUE 3. Pesticide–fertilizer Combination Products

Including Weed-and-Feed & Insecticide–Fertilizer Combination Products

### Concerns

Fertilizer is usually needed during the growing season when pesticides are not. Combination products therefore encourage unnecessary or harmful use of pesticides.

Often, active ingredients in pesticide–fertilizer combination products for lawns are found in water at levels toxic to aquatic invertebrates.

Pesticide use on lawns expose children and pets to pesticides during application or within one day of application. Some combination products include insecticides or herbicides that have potential health effects on people or pets.

Pesticide–fertilizer combination products are formulated as granules, which often end up spilled on sidewalks and driveways, and easily move off target causing environmental contamination. Other formulations such as liquids are more likely to stay on site.

### Recommendations Fully Supported by Working Group

1. Provide better education to the public and professionals about when various garden chemical products are required and when application is best timed.
2. Promote use of applicators that reduce deposition of granules on hard surfaces (e.g., Scotts Miracle-Gro's Edgeguard).
3. Educate people to sweep granules off of hard surfaces and on to lawns, and not to hose off or sweep granules into the gutter or storm drains.

### Recommendations Not Fully Supported by Working Group

4. DPR discuss environmental and health concerns with registrants of combination products.
5. Provide information at point-of-sale outlets and train retail employees to advise customers about advantages of applying fertilizers and pesticides separately.
6. As part of the registration or reregistration process, require registrants to provide easy-to-carry-out procedures for proper calibration of spreaders for these granular products.

[For 4, 5, & 6, all except Western Plant Health Association]

### Rationale for Recommendations

Home gardeners and landscape professionals would achieve more effective pest management and better plant growth if products were applied separately according to need and proper timing. More environmentally sound alternatives are often available for insecticides or herbicides in combination products.

Elimination of fertilizer–pesticide combinations would reduce unnecessary use of pesticides that may cause environmental harm.

# ISSUE 4. Sewer Line Applications

### Concerns

When insecticides or root killers are used in sewer manholes and sewer lines, the products are likely to end up in wastewater, especially when multiple applications occur at the same time.

### Recommendation Fully Supported by Working Group

**1** DPR work with TriTAC to design and implement a notification system so that sewage treatment plants will know in advance the date, amount, and active ingredients of collection system sewer treatments for root control.

### Rationale for Recommendation

Sewage treatment plants, also known as publicly owned treatment works (POTWs), typically treat wastewater with bacteria, which can be killed or inhibited by toxic chemicals. In addition, POTWs have stringent effluent limits to protect surface water that must be met before discharge. One of the most stringent of those limits is a chronic toxicity test where egg, larval or juvenile organisms are subjected to the effluent. The test species are specifically chosen by regulatory agencies to be the most sensitive ones for a particular effluent. POTWs are triggered into exhaustive studies and source-control measures when toxicity is identified. Therefore, increases in toxic chemicals discharged to POTWs are unwelcome.

Literature shows that root killers will inhibit nitrification (a sensitive biological step for many POTWs) at particular concentrations.

Applicators should be required to notify the wastewater plant of intended dates and amounts of applications so that wastewater plant operators can ensure that all of the applications on a particular day won't approach problematic concentrations.

Note that the recommendation refers to sewer cleanout by municipalities, not residential cleanouts. The recommendation does not address cockroach treatments.

# ISSUE 5. Treatment of People and Pets for Arthropod[3] Pests

### Concerns

Insecticides used to treat for lice or wash pets will enter the sanitary sewer.[4] Some insecticides are misused; for example, some consumers use products for louse control that are not labeled as such.

### Recommendations Fully Supported by Working Group

1 Explore with the California Integrated Waste Management Board and others as appropriate the potential for marketing single-use packages

2 DPR consider using methods developed by the Pyrethroid Working Group to evaluate pesticides for removal efficiency.

### Recommendations Not Fully Supported by Working Group

3 DPR work with registrants to require information on how much pesticide is entering or can potentially enter a POTW and what the POTW's treatment efficiency is or will be for that product. For new compounds the treatment plant removal efficiency should be pilot tested.

4 Registrants conduct pilot tests on sample POTWs to determine impact & treatment efficiency.

[For 3 & 4, support by all except Consumer Specialty Products Association and Western Plant Health Association.]

### Rationale for Recommendations

Publicly owned treatment works (POTWs) typically treat wastewater with bacteria that can be killed or inhibited by toxic chemicals. In addition, POTWs have stringent effluent limits to protect surface water that must be met before discharge. One of the most stringent of those limits is a chronic toxicity test where egg, larval or juvenile organisms are subjected to the effluent. The test species are specifically chosen by regulatory agencies to be the most sensitive ones for a particular effluent. POTWs are triggered into exhaustive studies and source control measures when toxicity is identified. Therefore, increases in toxic chemicals discharged to POTWs are unwelcome.

[3] Arthropods = insects, mites, ticks

[4] Head louse shampoo and topical scabies lotion are regulated by U.S. FDA as drugs, not by DPR as pesticides. As of August 21, 2007, per U.S. EPA, registrants have voluntarily eliminated several previously allowable uses of allethrins resulting in cancellation of all pet treatments of products that contain allethrins.

# ISSUE 6. Interior Applications

*Applications made to the interior of structures—commercial or residential—designed to reduce damage or evidence of pests, or kill pests indoors. Applications include those to basement, baseboards of rooms, walls, ceilings, and attic.*

### Concerns

When floors are cleaned, excess water may wash pesticide residues down drains (e.g., bathroom drains in commercial buildings or institutions). Building occupants and pets may be exposed to pesticide residues.

### Recommendation Fully Supported by Working Group

1 Promote preventive practices in a context of IPM through a consumer education campaign.

### Recommendations Not Fully Supported by Working Group

2 DPR work with registrants to require information on how much pesticide is entering or can potentially enter a POTW, and what the POTW's treatment efficiency for that product. For new compounds, the treatment plant removal efficiency should be pilot tested.

3 DPR recommend to U.S. EPA that product label read: "Use only amount needed. Pesticides that go down drains enter the sewer system and cannot be completely removed by sewage treatment plants, eventually ending up in rivers, bays, and oceans."

[Support by all except Western Plant Health Association.]

### Rationale for Recommendations

Preventive chemical treatments of surfaces that are washed frequently waste money and add unneeded toxics to wastewater treatment plants.

Publicly owned treatment works (POTWs) typically treat wastewater with bacteria that can be killed or inhibited by toxic chemicals. In addition, POTWs have stringent effluent limits to protect surface water that must be met before discharge. One of the most stringent of those limits is a chronic toxicity test where egg, larval or juvenile organisms are subjected to the effluent. The test species are specifically chosen by regulatory agencies to be the most sensitive ones for a particular effluent. POTWs are triggered into exhaustive studies and source-control measures when toxicity is identified. Therefore, increases in toxic chemicals discharged to POTWs are unwelcome.

# ISSUE 7. Incorporation Into Products

*The incorporation of a pesticide (nanoparticles or otherwise) into products such as clothing, washing machines, and cutting boards.*

### Concerns

Insecticides and biocides impregnated in clothing to deter mosquitoes or other pests enter the sanitary sewer when the clothing is washed. Silver and copper nanoparticles incorporated into washing machines, cutting boards and other products also enter the sanitary sewer. A principal concern is that nanoparticle use is new and may grow rapidly unless regulated carefully.

### Recommendations Fully Supported by Working Group

1. DPR should consider regulating products that intentionally incorporate pesticides, *even if pesticidal claims are not made*. Only grant registration if pesticidal claims are determined to be valid.
2. Consider availability of alternatives when registering products whose active ingredients pose environmental or health problems.

### Rationale for Recommendations

DPR should regulate pesticides added to clothing, kitchen tools, washing machines and other items with a direct pathway to the sanitary sewer or storm drain system. The regulatory process should include an efficacy determination. If there is no or little benefit from the inclusion of a toxic substance, it should not be allowed or registered. When the toxic addition is primarily a marketing tool and adds no value to the product, registration of that use should not occur.

Publicly owned treatment works (POTWs) typically treat wastewater with bacteria that can be killed or inhibited by toxic chemicals. In addition, POTWs have stringent effluent limits to protect surface water that must be met before discharge. One of the most stringent of those limits is a chronic toxicity test where egg, larval or juvenile organisms are subjected to the effluent. The test species are specifically chosen by regulatory agencies to be the most sensitive ones for a particular effluent. POTWs are triggered into exhaustive studies and source control measures when toxicity is identified. Therefore increases in toxic chemicals discharged to POTWs are unwelcome.

# ISSUE 8. Landscape Application by Professionals

### Concerns

Many licensed and unlicensed professional landscapers apply granular herbicides, fertilizers, or combination herbicide–fertilizer products adjacent to sidewalks where they can enter storm drains that discharge into urban creeks.

### Recommendations Fully Supported by Working Group

1. DPR support efforts to promote landscape designs that reduce runoff of pesticides.
2. DPR support efforts to establish a voluntary IPM Certification program for landscape professionals.
3. DPR explore ways (including enforcement) to increase licensing among unlicensed individuals such as maintenance gardeners who apply pesticides for hire.
4. DPR promote education of consumers about the need to hire only licensed professionals to apply pesticides in their homes and landscapes.
5. DPR explore requiring additional continuing education units that would include IPM.

### Rationale for Recommendations

As the population of the state of California is expected to grow exponentially in the next decade, it is important that more education and outreach be conducted for those urban landscape professionals that use registered pesticides to mitigate potential offsite movement that may lead to water or sediment contamination.

This carelessness in treatment may result in adverse impacts on urban creek sediment through untreated and unfiltered stormwater systems. Although the Pyrethroid Working Group is studying the various pathways that can contaminate water, it is imperative that educational efforts be provided in the interim to mitigate careless lawn treatment near sidewalks.

# ISSUE 9. Unlicensed and Untrained Applicators

### Concerns

Unlicensed and untrained applicators apply pesticides without oversight or training. In California, the majority of unlicensed people who apply pesticides do so without safety training, knowledge of appropriate use, or awareness of environmental impacts that result from misuse. Many people applying pesticides do not read the label in detail, and many overuse pesticides.

### Recommendations Fully Supported by Working Group

1. DPR work with the retail industry and others as appropriate to ensure that store employees who advise customers are adequately trained.
2. DPR work with county agricultural commissioners and local enforcement to prevent pesticide applications for hire by unlicensed professionals until they can obtain training and certification in pesticide safety and IPM practices.
3. DPR work with the University of California and UC IPM to establish a regional urban IPM training center to train applicators—both licensed and unlicensed—in IPM practices.
4. DPR work to enable unlicensed Maintenance Gardeners who use pesticides to obtain Qualified Applicator certificates (QACs).
5. Provide point-of-purchase information about pesticide safety, disposal and less-toxic alternatives at places where consumers or maintenance gardeners purchase pesticides.

### Rationale for Recommendations

**Consumer purchases at retail stores.** Consumers often apply pesticides as advised by store employees who may know little about pesticide application. Consumers would be less likely to misuse pesticides if store employees were trained to provide this information at point of sale. Training of store employees could be online or at an actual training center. Pesticide misapplication by consumers could be prevented by modifying pesticide containers with built-in measuring features, or favoring ready-to-use rather than concentrated products. In addition, retailers could be motivated to provide point-of-sale information on IPM, proper use of pesticides, and disposal of unused pesticides.

**Misuse by unlicensed professionals such as landscapers, in-house maintenance workers, or janitors.** Many within this broad category apply pesticides while not certified and do not receive the appropriate training, resulting in undesired consequences. Possible solutions include (1) a county campaign to identify landscapers who are applying products illegally and issue fines; (2) a multi-agency initiative to provide outreach to all landscapers to help them obtain licenses; (3) establishing an urban IPM center to train unlicensed applicators in IPM practices.

DPR can remove stumbling blocks for Maintenance Gardeners so they can become licensed in category Q as QACs. DPR could continue with current efforts to create a special licensing exam and study materials for this group, translate study materials and exams into Spanish and other languages, and support educational programs to prepare for exams.

**Establish a regional urban IPM training center to train applicators in IPM practices.** The IPM training center could be used to train a variety of audiences in enforcement and subject-matter expertise to pass licensing exams. In addition, it could be used to train in-house maintenance staff, janitorial services, and school districts both pesticide and nonchemical pest management practices. For professionals, such as pest control operators, training could address how to incorporate IPM into their pest management strategies as well as educate their customers about IPM.

# ISSUE 10. Indoor Total-release Foggers

### Concerns

Exposure may endanger human health, especially that of children, the elderly, the immune compromised, and other sensitive individuals. Foggers also present a risk of explosion and fire if directions aren't carefully followed.

### Recommendations Fully Supported by Working Group

1. DPR acquire data about explosions and fires caused by foggers.
2. DPR develop better information to inform consumers about appropriate use and risks of foggers.
3. DPR improve consumer education including point-of-sale messages about IPM alternatives and long-term solutions.

### Rationale for Recommendations

Alternative application methods that are more targeted and result in less human exposure are readily available. Foggers are usually used for fleas and cockroaches; yet, effective alternatives exist for both of these pests.

A number of fogger mishaps are recorded in California every year. Despite label directions instructing consumers to use only one fogger for a given area, more than one may be used, resulting in explosions, fires, or illness.

Two studies done by California researchers show that even when foggers were used according to label directions there was an increased chance of exposure. A 1997 study associated fogging with an increased risk for childhood brain tumors. A 2006 study showed that pesticide exposures from foggers were significantly higher than those from crack-and-crevice applications for both adults and children.

Two common fogger ingredients, permethrin and resmethrin, are likely to be carcinogenic to humans, according to U.S. EPA. Resmethrin is also known to the State of California as a likely developmental toxin. Two are possible human carcinogens (cypermethrin and tetramethrin), and one is a suggestive carcinogen (pyrethrins).

# ISSUE 11. Improving Education & Outreach

### Concerns

Many nonprofessional users of urban pesticides lack awareness about adverse impacts to human health or the environment that could result if they don't apply pesticides according to label directions, or store left over products or containers improperly. Some users are also unfamiliar with alternative pest management practices.

### Recommendation Fully Supported by Working Group

DPR, in collaboration with academia, business and nongovernmental organizations, develop and implement a strategy to educate and inform nonprofessional pesticide applicators (e.g., consumers and building custodians) on alternative pest management practices, the selection of reduced-risk pesticide products, and appropriate pesticide application practices to minimize impacts to human health and the environment.

### Rationale for Recommendation

As urban populations continue to expand throughout the State, the demand for pest management in urban areas will also continue to increase. There is an increasing need to educate consumers about the potential impacts resulting from inappropriate use, storage and disposal of pesticide products and containers. Furthermore, educating nonprofessional consumers about alternative pest management practices may reduce potential impacts associated with conventional practices. The Working Group recognizes that there are many existing efforts to educate and inform consumers. The Working Group encourages DPR to leverage its limited resources by expanding upon these efforts and partnerships with academia, local government, businesses, and nongovernmental organizations while exploring new approaches to further advance consumer education and awareness.

# Appendix 1. Members of the Urban Pest Management Working Group

| | Representation | About This Group |
|---|---|---|
| Robert Baker<br>*Darren Van Steenwyk, Alternate* | Pest Control Operators of California | Represents pest control operators, providing leadership, training, education, legislative involvement, and builds industry awareness |
| Phil Bobel | Tri-TAC | Technical advisory committee that works to strengthen environmental programs that impact sewage treatment plants in California |
| Stacy Carlsen | County Agricultural Commissioners | |
| Caroline Cox | Center for Environmental Health | A nonprofit organization that works with major industr and leaders in green business to promote healthier alternatives to toxic products and practices |
| Nasser Dean | Western Plant Health Association | |
| Mary Lou Flint | University of California<br>UC Statewide IPM Program | A statewide coordinating program within the University of California that promotes and develops the use of integrated, ecologically based IPM in California through education and research. |
| Tom Mumley | San Francisco Regional Water Board | |
| Laurie Nelson | Consumer Specialty Products Association | |
| Kelli Okuma<br>*Dennis Patzer, Alternate* | Structural Pest Control Board | |
| Jennifer Ryder Fox | California State University<br>CSU Chico<br>College of Agriculture | |
| Dave Tamayo | California Stormwater Quality Association | |

| DPR Representation | |
|---|---|
| Mark Rentz | Deputy Director, Policy Coordination |
| Nita Davidson | Staff Environmental Scientist, Pest Management & Licensing Branch |

# Appendix 2. Participating Interested Public

| | Representation | About the Group |
|---|---|---|
| Bill Chase | McLaughlin Gormley King | Industry |
| Larry Coltharp | Scotts Miracle-Gro | Industry |
| Billy Gaither | Pest Control Operators of California | Industry |
| Martyn Hopper | Pest Control Operators of California | Industry |
| Gary Maxwell | Target Specialty Products | Industry |
| Bill Metzger | Spectrum Brands | Industry |
| Pari Pachamuthu | Western Exterminator Company | Industry |
| Pete Price | Pete Price Consulting | Public Interest |
| Jim Robertson | Clark Pest Control | Industry |
| Laura Speare | UP3 Project | Regulatory |
| Jim Wells | Environmental Solutions Group | Industry |
| Keith Willingham | Western Exterminator Company | Industry |

# Appendix 3. Pesticide Issue Worksheets

## ISSUE 1: Preconstruction Pesticide Application

**Originally presented by Dave Tamayo on June 4, 2007**

### Concerns

During building construction, high rates of pyrethroid termiticides are often applied to the excavated foundation before concrete is poured. Cypermethrin and permethrin are labeled for this use, and have been identified as a significant source of toxicity in sediments associated with urban runoff. After the termiticide application and before the concrete is poured, unexpected rainfall and runoff of exposed, treated areas could move contaminated sediment into urban creeks. The Working Group's concern is not necessarily with the application itself, but with potential runoff associated when the application is made before a rain storm.

### Responses to Concerns and Justifications

There haven't yet been formal analyses of preconstruction applications to show whether the problem is widespread. Also, in September 2006, U.S. EPA proposed label statements for cypermethrin products used as preconstruction termiticides, and these statements may be extended to permethrin products as well.

### Recommendations

1. DPR discuss with representatives from the building and pesticide applicator industries opportunities to develop and implement best management practices (BMPs) to minimize the risk of pesticide runoff associated with preconstruction applications from entering water bodies or stormwater systems.
2. DPR consult with the U.S. EPA about the feasibility of including those BMPs as modifications to preconstruction pesticide product labels.
3. DPR consult with the State Water Resources Control Board regarding modification of their General Permit for Construction Sites to require construction site managers to: (1) identify pesticide applications such as termiticides and herbicides that will take place before or during construction; and (2) include BMPs to minimize runoff associated with preconstruction pesticide applications in their Storm Water Management Plan for the construction site.
4. DPR evaluate opportunities to design and implement cost-effective metrics to measure the implementation and effectiveness of the BMPs.

### Rationale for Recommendations

Once BMPs are developed, listing them on product labels would ensure that applicators understand their responsibility when applying pesticides at construction sites. Product label information and outreach to the construction industry would help increase BMP awareness and implementation. Outreach that focuses on effective alternatives may also help reduce of pesticide runoff.

Current reporting requirements do not indicate that a preconstruction application has been made. To estimate the amount of pesticides subject to runoff in urban areas, it's necessary to separate above-ground, underground, and indoor pesticide applications. It's also necessary to know the application's location by region or even specific watershed.

# ISSUE 2. Perimeter Applications Around Structures

**Tom Mumley and Dave Tamayo**

### Concerns

- Pesticides run off into foundation drains or directly into storm drains from rain or irrigation.
- Applications on impervious surfaces increase the probability of runoff.
- Broadcast applications around the entire perimeter of a building may result in an unnecessarily high amount of applied active ingredient.
- The calendar-based nature of many broadcast perimeter applications may result in an unnecessarily high amount of applied active ingredient.

### Recommendations

**1** *Advanced by Tom Mumley & Dave Tamayo*: DPR support an IPM certification program with the Structural Pest Control Board (SPCB) for applications around structures.

**a** Site-based certification by an accredited third party.

**b** Professional certification (business and individual) to design site-based IPM plan and to service a site-based IPM plan

**c** Certification of nonprofessionals (municipal employees, site business employees, residents)

*Discuss rewording as follows*: DPR work with SPCB, the structural pesticide industry, and professional applicators to develop an education and training strategy to advance the implementation of BMPs that address urban pest management issues, including pesticide runoff.

**2** Advanced by the group: Educate consumers to ask about safer, more efficacious alternatives to perimeter treatments if they are hiring professionals.

**3** Advanced by Tom Mumley & Dave Tamayo: Increase monitoring, surveillance, and enforcement to identify, prevent, and correct applications that result in pesticide releases to surface waters.

**4** Advanced by Mark Rentz & Robert Baker: DPR discuss with representatives from the SPCB and the pesticide applicator industry opportunities to

**a** develop and implement best management practices (BMPs) that reduce pesticide runoff associated with perimeter applications

**b** establish education and training to teach and implement the BMPs.

### Justifications for Concerns

Urban pesticide uses that are of most concern to water quality are those associated with applications to or near water, applications that can result in discharges to storm drains, applications on outdoor impervious surfaces, and applications that result in use of large quantities of active ingredient in a drainage area (watershed). Perimeter applications around structures have or potentially have all of these attributes.

Supporting documents can be found at http://www.up3project.org/up3_monitoring.shtml.

**Rationale for Recommendations**

- One of the main reasons for perimeter applications of pesticides is to keep Argentine ants out of buildings. Colonies of these ants are massive, and perimeter applications of pesticides have only limited short-term effects.
- Efforts are underway. The SF Bay Water Board is requiring municipalities to implement IPM policies. EcoWise Certified is a Proposition 13-funded pilot project of the Association of Bay Area Governments to certify professional service providers. The PCOC has asked to change the certification from the pest control company to the customer site, and refer to successful third-party verification of IPM practices and compliance with standards such as the NOP Organic Certification standards.
- Currently, both of these types of applications are recorded as "structural pest control." To estimate the amount of pesticides subject to runoff in urban areas, it is necessary to separate above ground and underground/indoor pesticide applications.
- Many pesticides are toxic and potentially hazardous substances that are too readily available without restrictions.
  - People consider them safe because they are approved by U.S. EPA.
  - They are not expensive and are available everywhere.
  - Permit to use comes with purchase (the label) without oversight or accountability mechanisms.
  - Consumers are likely to misuse or overuse pesticides and not dispose of them properly.
  - Point-of-sale outreach efforts like Our Water, Our World demonstrate consumers will purchase alternatives to high-risk pesticides when provided informed options, and retailers are happy to sell alternatives.
  - Currently, it is extremely difficult to determine the amount of over-the-counter use of pesticides used in any given area.
  - Prescription vs. over-the-counter drug sales provides a parallel to pesticide sales.
- Broadcast applications around building perimeters result in pesticide applications to impervious surfaces that easily wash off during subsequent rain events or irrigation. U.S. EPA's recent reregistration of cypermethrin limits outdoor applications to impervious surfaces to spot treatment.
- DPR and County Ag Commissioners are currently underfunded to conduct monitoring, surveillance, and enforcement in urban areas. DPR created an initial, statewide surveillance and monitoring program for pesticides in surface water, but its implementation was never funded.

# ISSUE 3. Pesticide–fertilizer Combination Products

## Including Weed-and-Feed & Insecticide–Fertilizer Combinations

**Mary Louise Flint**

### Concerns

- Fertilizer often needed when pesticides are not. Combination products encourage unnecessary or harmful use of pesticides
- Insecticide–fertilizer combinations for lawns often contain pyrethroids found in water at levels toxic to aquatic invertebrates. Fertilizer/insecticide combinations encourage unnecessary use of pyrethroids, which can lead to environmental damage.
- Herbicide–fertilizer combinations include herbicides that have water quality or other environmental problems. Combination products encourage unnecessary or ineffective use of herbicides.
- Pesticide use on lawns results in exposure to children and pets during application or within one day of application. Some combination products include herbicides or insecticides that have potential health effects on people or pets. Applying combination products when pests aren't a problem exposes people and pets unnecessarily to risk.
- Fertilizer–pesticide combination products are formulated as granules, which are spilled on sidewalks and driveways and easily move off target causing environmental damage. Other formulations are more likely to stay on site.

### Justifications for Concerns

- The University of California recommends fertilizing lawns 3–4 times per year and applying herbicides less than yearly only when cultural practices haven't worked and weeds have gotten out of hand. Likewise, insecticides should be applied only when damaging levels of insects are found—in Sacramento County, this would involve fewer than 5 percent of all lawns (Flint, unpub. data).
- Weed or insect control may often need to be concentrated in a small area of the lawn. However, use of combination products discourages spot treating with pesticides because fertilizer on lawns needs to be evenly spread.
- Often the herbicides in weed-and-feed products do not target the particular weed species in a lawn or stage of weeds (e.g., preemergent herbicides are not effective on already germinated weeds and shouldn't be applied later in the season when fertilizers are applied).
- Unnecessary use of pyrethroid insecticides engendered by insecticide–fertilizer combinations poses special risks for water quality.
- Some herbicides (e.g., dicamba and triclopyr) in some weed-and-feed products can be absorbed by tree roots and cause tree injury. Unnecessary use of these products should be avoided.
- In most parts of California, a 2004 federal court order requires a buffer zone 20 yards from the edge of salmon-supporting waters (e.g., storm drains) for several herbicides, including 2,4-D and triclopyr, which are both found in combination products.
- Many of the fertilizer–pesticide combination products are formulated as granulars and are commonly deposited on hard surfaces during normal application procedures and

washed off into storm drains with the potential for environmental harm. Alternate insecticide or weed control products may be formulated in ways that are less likely to move.

- Elimination of pesticide–fertilizer combination products would reduce unnecessary use of pesticides that cause environmental harm. More environmentally sound alternatives are often available for insecticides or herbicides in combination products.

### Recommendations

1. Provide better education to the public and professionals about when various garden chemical products are required and when application is best timed.
2. DPR discuss environmental and health concerns with registrants of combination products.
3. Provide information at point-of-sale outlets and train retail employees to advise customers about advantages of applying fertilizers and pesticides separately.
4. Promote use of applicators that reduce deposition of granules on hard surfaces (e.g., Scotts Miracle-Gro's Edgeguard).
5. Educate people to sweep granules off of hard surfaces and on to lawns, and not to hose off or sweep granules into the gutter or storm drains.
6. As part of the registration or reregistration process, require registrants to provide easy-to-carry-out procedures for proper calibration of spreaders for these granular products.

### Rationale for Recommendations

Home gardeners and landscape professionals will get more effective pest management and fertilizer response if products are applied singly according to need and proper timing.

Elimination of fertilizer–pesticide combinations will reduce unnecessary use of pesticides which may cause environmental harm.

More environmentally sound alternatives are often available for insecticides or herbicides in combination products.

# ISSUE 4. Sewer Line Applications

**Phil Bobel**

### Concerns

- When insecticides are used in sewer manholes and sewer lines the product is likely to end up in the wastewater. The concern is amplified if multiple applications are occurring at one time.
- When root killers are applied in sewer lines, the product is very likely to end up in the wastewater. The concern is amplified if multiple applications are occurring at one time.

### Justifications for Concerns

Publicly owned treatment works (POTWs) typically treat wastewater with bacteria that can be killed or inhibited by toxic chemicals. In addition, POTWs have stringent effluent limits to protect surface water that must be met before discharge. One of the most stringent of those limits is a chronic toxicity test where egg, larval or juvenile organisms are subjected to the effluent. POTWs are triggered into exhaustive studies and source control measures when toxicity is identified. The test species are specifically chosen by regulatory agencies to be the most sensitive ones for a particular effluent. Therefore increases in toxic chemicals discharged to POTWs are unwelcome.

Literature shows that root killers will inhibit nitrification (a sensitive biological step for many POTWs) at particular concentrations.

### Recommendation

DPR work with TriTAC to design and implement a notification system so that POTWs will know in advance the date, amount, and active ingredients of collection system sewer treatments for root control.

### Rationale for Recommendation

Applicators should be required to notify the wastewater plant of intended dates and amounts of applications so that wastewater plant operators can ensure that all of the applications on a particular day won't approach problematic concentrations.

Note that the recommendation refers to sewer cleanout by municipalities, not residential cleanouts. Does not refer to cockroach treatments.

# ISSUE 5. Treatment of People and Pets for Arthropod Pests

**Phil Bobel**

### Concerns

- Insecticides used to treat for lice will enter the sanitary sewer.
- Insecticides used to wash pets will enter the sanitary sewer.

### Justifications for Concerns

Publicly owned treatment works (POTWs) typically treat wastewater with bacteria that can be killed or inhibited by toxic chemicals. In addition, POTWs have stringent effluent limits to protect surface water that must be met before discharge. One of the most stringent of those limits is a chronic toxicity test where egg, larval or juvenile organisms are subjected to the effluent. POTWs are triggered into exhaustive studies and source control measures when toxicity is identified. The test species are specifically chosen by regulatory agencies to be the most sensitive ones for a particular effluent. Therefore increases in toxic chemicals discharged to POTWs are unwelcome.

### Recommendations

1. DPR work with registrants to require information on how much pesticide is entering or can potentially enter a POTW and what the POTW's treatment efficiency is or will be for that product. For new compounds the treatment plant removal efficiency should be pilot tested.
2. Registrants to conduct pilot tests on sample POTWs to determine impact & treatment efficiency.
3. Explore the potential for marketing single-use packages.
4. DPR consider using methods developed by the Pyrethroid Working Group to evaluate pesticides for removal efficiency.

### Rationale for Recommendations

Arthropods = insects, mites, ticks

Head louse shampoo and topical scabies lotion are regulated by U.S. FDA as drugs. As of August 21, 2007, per U.S. EPA, registrants have voluntarily eliminated several previously allowable uses of allethrins resulting in cancellation of all pet treatments of products that contain allethrins.

# ISSUE 6. Interior Applications

**Phil Bobel**

### Examples

Applications made to the interior of structures—commercial or residential—designed to reduce damage or evidence of pests, or kill pests indoors. Applications include those to basement, baseboards of rooms, walls, ceilings, and attic.

### Concerns

- When floors are cleaned, excess water may wash pesticide residues down drains (e.g., bathroom drains in commercial buildings or institutions).
- Building occupants and pets may be exposed to pesticide residues.

### Justifications for Concerns

Publicly owned treatment works (POTWs) typically treat wastewater with bacteria that can be killed or inhibited by toxic chemicals. In addition, POTWs have stringent effluent limits to protect surface water that must be met before discharge. One of the most stringent of those limits is a chronic toxicity test where egg, larval or juvenile organisms are subjected to the effluent. POTWs are triggered into exhaustive studies and source control measures when toxicity is identified. The test species are specifically chosen by regulatory agencies to be the most sensitive ones for a particular effluent. Therefore increases in toxic chemicals discharged to POTWs are unwelcome.

Pesticide levels in humans from indoor applications to kill cockroaches are documented in papers by Gregory Williams (2005) and Megan Williams (2006).

### Responses to Concerns and Justifications

### Recommendations

1. DPR work with registrants to require information on how much pesticide is entering or can potentially enter a POTW, and what the POTW's treatment efficiency for that product. For new compounds, the treatment plant removal efficiency should be pilot tested.
2. DPR recommend to U.S. EPA that product label read: "Use only amount needed. Pesticides that go down drains enter the sewer system and cannot be completely removed by sewage treatment plants, eventually ending up in rivers, bays, and oceans."
3. Promote alternative preventive practices through a consumer education campaign.

### Rationale for Recommendations

Preventive chemical treatments of surfaces that are washed frequently are not useful. These treatments waste money and add unneeded toxics to wastewater treatment plant loading.

# ISSUE 7. Incorporation Into Products

**Phil Bobel**

### Examples

The incorporation of a pesticide (nanoparticles or otherwise) into consumer products such as clothing, washing machines, and cutting boards.

### Concerns

- Insecticides and biocides impregnated in clothing to deter mosquitoes or other pests enter the sanitary sewer when the clothing is washed.
- Silver and copper nanoparticles incorporated in washing machines, cutting boards and other products enter the sanitary sewer.
- A principal concern is that this type of "use" is new and may grow rapidly unless regulated carefully.

### Justifications for Concerns

Publicly owned treatment works (POTWs) typically treat wastewater with bacteria that can be killed or inhibited by toxic chemicals. In addition, POTWs have stringent effluent limits to protect surface water that must be met before discharge. One of the most stringent of those limits is a chronic toxicity test where egg, larval or juvenile organisms are subjected to the effluent. POTWs are triggered into exhaustive studies and source control measures when toxicity is identified. The test species are specifically chosen by regulatory agencies to be the most sensitive ones for a particular effluent. Therefore increases in toxic chemicals discharged to POTWs are unwelcome.

Both silver and copper are environmental toxins, especially as nanoparticles, where their large surface area amplifies their toxic effects.

### Responses to Concerns and Justifications

### Recommendations

1. Regulate pesticides intentionally incorporated in consumer products, *even if pesticidal claims are not made*. Only grant registration if pesticidal claims are determined to be valid.
2. Consider availability of alternatives when registering products whose active ingredients pose environmental or health problems.

### Rationale for Recommendations

DPR should regulate pesticides added to clothing, kitchen tools, washing machines and other items with a direct pathway to the sanitary sewer or storm drain system. The regulatory process should include an efficacy determination. If there is no or little benefit from the inclusion of a toxic substance, it should not be registered or allowed. When the toxic addition is primarily a marketing tool, registration of that use should not occur.

# ISSUE 8. Landscape Application by Professionals

**Nasser Dean**

### Concerns

Many licensed and unlicensed professional landscapers carelessly apply granular herbicides and/or fertilizers adjacent to sidewalks where they can enter storm drains that have no filtration system and discharge into urban creeks.

### Justifications for Concerns

This carelessness in treatment may result in adverse impacts on urban creek sediment through untreated and unfiltered stormwater systems. Although the Pyrethroid Working Group is studying the various pathways/routes that can lead to water issues, it is imperative that educational efforts be provided in the interim to mitigate careless lawn treatment near sidewalks.

### Responses to Concerns and Justifications

### Recommendations

1. DPR support efforts to promote landscape designs that reduce runoff of pesticides.
2. DPR support efforts to establish a voluntary IPM Certification program for landscape professionals.
3. DPR explore ways (including enforcement) to increase licensing among nonlicensed individuals such as maintenance gardeners who apply pesticides for hire.
4. DPR promote education of consumers about the need to hire only licensed professionals to apply pesticides in their homes and landscapes.
5. DPR explore requiring additional continual education units that would include IPM.

### Rationale for Recommendations

As the population of the state of California is expected to exponentially grow in the next decade, it is important that more education and outreach be conducted for those urban landscape professionals that use registered pesticides in an effort to mitigate any potential for off-site movement that may lead to water or sediment contamination.

# ISSUE 9. Unlicensed and Untrained Applicators

**Robert Baker & Darren Van Steenwyk**

### Concerns

Unlicensed and untrained applicators apply pesticides without oversight or training.

### Justifications for Concerns

- In California, the majority of unlicensed people who apply pesticides do so without safety training, knowledge of appropriate use, or awareness of environmental impacts that result from misuse.
- Many of the people applying pesticides do not read the label in detail as cited by UC IPM surveys. [Residential Pesticide use in California, Mary Louise Flint, UC IPM, March 15 2003; Tracking Nonresidential pesticide use in Urban Areas of California, Cheryl Wilen, UC IPM, June 10, 2005]

### Responses to Concerns and Justifications

Agreement within the Working Group

### Recommendations

#### Consumers [Over the Counter (OTC)]

1. Only credentialed individuals allowed to advise and make recommendations to any perspective customers at point of sale
2. Adjust OTC product packaging to allow for ease of measurement (replace current packaging with tip-n-pour/squeeze-n-pour bottles)
3. Use Urban IPM Center to teach retailers about pest control to help them make the appropriate recommendations

#### Unlicensed professional misuse

*(by landscapers, in-house maintenance, janitors)*

4. State–county campaign identify landscapers who are applying products illegally and issue fines
5. State government provide outreach to all landscapers to enable them to get licensed
6. Use Urban IPM Center for training unlicensed applicators to demonstrate IPM practices, what it looks like in a facility, what thresholds look like, what paperwork to expect
    - Use as training for enforcement (ag commissioners, ag inspectors, third-party auditors, DPR, in-house QA/auditors)
    - Use as training for in-house maintenance staff, janitorial services, schools
    - Use as training to help staff and applicators to pass licensing test

#### Professional misuse

7. Adjust customer expectations
    - Public outreach to teach about environmental impacts when pesticides are over-applied

- Include in that outreach education on IPM, the process of IPM, and the customer's involvement in the pest management process
- Adjust consumer action-level thresholds (change what consumers are asking for)

**8** Streamline products on to market to allow pyrethroid substitution

**a** New products are more targeted in label language and selective in activity

**b** Give a wider variety of chemistries for the PCO to become less reliant on pyrethroid class of chemistry

**c** Provide research to identify specific use patterns that are concern

**9** Supply research for new application equipment and nonpesticide-centered pest management practices such as steam for cockroaches

**10** Use Urban IPM Center for training for unlicensed applicators to demonstrate what IPM is, what it looks like in a facility, what thresholds look like, paperwork

**11** Teach IPM to PCOs who have little exposure to practices or how to implement in the field

### Rationale for Recommendations

**Over the Counter (OTC)**

- These suggestions along with others may help the consumer to make a more informed decision on product selection and the packaging more "friendly"

**Unlicensed professional misuse** (landscapers, in-house maintenance, janitors)

- A worker may not understand where to purchase the appropriately labeled product (i.e., it is a label violation if use an OTC product in a commercial setting if label states for residential or homeowner use only)
- A company may be trying to provide the highest level of service to their customers and not know of the legal implications or have the means to follow those laws

**Professional misuse**

- Making legal applications of registered products
- Servicing the customer to level the customer wants to be serviced

# ISSUE 10. Indoor Total-release Foggers

**Caroline Cox**

### Concerns

- Exposure may endanger human health (especially that of children, the elderly, the immune compromised, and other sensitive individuals).
- Risk of explosion and fire if directions aren't carefully followed.

### Justifications for Concerns

- A recent study presented at the Fall 2006 American Chemical Society National Meeting showed that exposures from foggers are significantly higher than exposures from crack-and-crevice applications for both adults (2.6 vs. 0.55 micrograms per kilogram) and children (11 vs. 1.5 micrograms per kilogram) (J.J. Keenan, Y. Li, R.S. Gold, G. Leng, and R.I. Krieger. *Indoor exposure to pyrethroid pesticides following fogger use or crack and crevice treatment by homeowners*.)
- Explosions caused by foggers have been reported in California. For example, fumes from a gas pilot light ignited 18 foggers used in a small San Diego apartment, ripping open the ceiling and tearing kitchen cabinets from the walls. A Los Angeles woman sustained burns when 30 foggers exploded in her home, blowing off the roof.

DPR regularly receives reports about illnesses caused by foggers. Examples include:

- A 53-YEAR-OLD MAN BECAME ILL AFTER ENTERING HIS MOBILE HOME TRAILER WHICH THE MANAGER HAD TREATED WITH A FOGGER.
- A RESIDENT SET UP 2 FOGGERS TO KILL INSECTS IN HIS HOME & LEFT THE HOUSE FOR LUNCH. HE RETURNED 1 1/2 - 2 HOURS LATER & OPENED THE WINDOWS TO AIR OUT THE HOUSE. HE THEN REMAINED INSIDE. HE DEVELOPED AN ATRIAL FLUTTER & SUFFERED A STROKE IN THE HOSPITAL.
- A VECTOR CONTROL EMPLOYEE FOGGED AN OFFICE FOR FLEAS ON A WEEKNIGHT. SECURITY REQUIREMENTS AND LAYOUT MADE AERATION PROBLEMATIC. WEEKEND APPLICATIONS HAVE GONE WELL, BUT THIS ONE LEFT AN ODOR EVERYONE NOTICED. ONE WORKER DEVELOPED SYMPTOMS.
- A SANDWICH SHOP MANAGER FOGGED THE SHOP BUT DID NOT VENTILATE IT. A WORKER ARRIVED SEVEN HOURS LATER TO OPEN THE SHOP AND DEVELOPED SYMPTOMS THAT PERSISTED UNTIL SHE SAW A DOCTOR TWO WEEKS LATER.
- A TEN MONTH OLD ATTENDED A DAY CARE HOME THAT HAD BEEN FOGGED WITH AN ANT BOMB 24 HOURS EARLIER. THE CHILD DEVELOPED BREATHING DIFFICULTY. THE CHILD HAD A REPORTED HISTORY OF ASTHMA AND EPILEPSY. NO VIOLATIONS WERE CITED.
- AN EMPLOYEE FOGGED AN APARTMENT. ANOTHER EMPLOYEE ENTERED THE APARTMENT 3 HOURS LATER TO CLEAN THE CARPETS. UPON ENTERING THE APARTMENT, HE NOTICED SOMEONE HAD FOGGED IT SO HE OPENED THE DOORS AND WINDOWS. BY THEN, HE FELT ILL AND INFORMED A MANAGER

- Fogging was associated with an increased risk for childhood brain tumors in a study done at the University of Southern California. (*Household Pesticides and Risk of Pediatric Brain Tumors*. Janice M. Pogoda and Susan Preston-Martin. *Environmental Health Perspectives* 105:1214–1220 (1997))
- Two common fogger ingredients (permethrin and resmethrin) are likely to be carcinogenic to humans, according to U.S. EPA. Two are possible human carcinogens (cypermethrin and tetramethrin), and one is a suggestive carcinogen (pyrethrins). ("Chemicals Evaluated for Carcinogenic Potential." U.S. Environmental Protection Agency. Office of Pesticide Programs. April 26, 2006.)

- In 1998, EPA adopted flammability labeling changes for pesticide foggers in order to "reduce the potential for fires and explosions by alerting consumers to the dangers of total release foggers." EPA said it received reports of fires and explosions involving total release foggers going back over 12 years. During a one-year period, the New York City Fire Department reported 40 incidents of fires and explosions involving total release foggers, with 28% resulting in personal injury. Other incidents have been reported to EPA and through the media. Fire experts believe that actual number of incidents to be much higher than those reported because there is no nationwide reporting system. (added by NAD)
- Brenner, B.L., S. Markowitz, M. Rivera, H. Romero, M. Weeks, E. Sanchez, E. Deych, A. Garg, J. Godbold, M. S. Wolff, P. J. Landrigan, and G. Berkowitz. 2003. Integrated pest management in an urban community: a successful partnership for prevention. Environ. Health Perspect. 111:1649–1653.

### Responses to Concerns and Justifications

#### *Opposing Information*

About 6.8 million fogger units are sold in California each year. Since 1992 the average yearly number of reported medical episodes involving foggers in California is 9.1—about 0.000133% of all units sold—and has been declining since 2002. For all reports received by DPR's Pesticide Illness Surveillance Program, 1992–2005, about one percent of the treatment episodes or reported cases were related to foggers.

Foggers, when used as directed, can rid residences of heavy or widespread insect infestations. Consumers are instructed by the label directions to vacate the premises until the airborne particles have settled; thus, there is no exposure, or only very limited exposure when cleaning surfaces after application. Foggers are effective because they are inexpensive devices that allow consumers to kill pests in living spaces.

Foggers limit pest infestations in lower-income areas where professional services are not economically feasible. Public health dangers from pest infestations are numerous. For example, cockroaches have been shown experimentally to transport pathogenic bacteria and viruses on their legs and bodies. One study[5] found that children allergic to cockroach allergens—such as shed skins and feces—and heavily exposed to these insects were three times more likely to be hospitalized than other asthmatic youth.

### Recommendations

1 DPR acquire data about explosions and fires caused by foggers.

2 DPR develop better information to inform consumers about appropriate use and risks of foggers

3 DPR improve consumer education including point-of-sale messages about IPM alternatives and long-term solutions

### Rationale for Recommendations

Alternative application methods that are more targeted and result in less human exposure are readily available.

---

[5] Rosenstreich, D.L., P. Eggleston, M. Kattan, D. Baker, R.G. Slavin, P. Gergen, H. Mitchell, K. McNiff-Mortimer, H. Lynn, D. Ownby, F. Malveaux. 1997. The Role of Cockroach Allergy and Exposure to Cockroach Allergen in Causing Morbidity Among Inner-City Children with Asthma. New Eng. J. Med. 336(19):1356–1363.